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EXAMINER

THAI, SUSAN

ART UNIT

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,020	Applicant(s) CRAMER ET AL.	
	Examiner SUSAN THAI	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060914, 20070130</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. The preliminary amendment filed on 09/14/2006 where claims 1-15 are canceled and claims 16-30 were added is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 16, 17, 22 and 23 rejected under 35 U.S.C. 102(b) as being anticipated by Usami et al. (US 4,875,981).

Regarding **claim 16**, Usami discloses sensor element (2) for determining a concentration of a target gas component in a gas mixture (abstract), comprising:

a solid electrolyte body (4);

an external electrode (8) exposed to the target gas component and situated in a first cavity (see Fig. 2, where the first cavity is considered the area located on top of the electrolyte (4) and between the heaters (30)) formed in the solid electrolyte body (4);

an internal electrode (6) situated in the solid electrolyte body (4); and

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an electrical resistance heater (28a) embedded in an electrical insulation (28b), wherein the electrical resistance heater (28a) and the electrical insulation (28b) are situated inside the solid electrolyte body (4), and wherein the electrical resistance heater (28a) has a meander-shaped heating surface (see Fig. 2 it is inherent that the heater has a meander shape since it is extended along the length of the sensor element (2)).

Regarding **claim 17**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the external electrode (8) is situated on the bottom of the first cavity (see Fig. 2) facing away from the outside of the solid electrolyte body (4).

Regarding **claim 22**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the solid electrolyte body (4) has a second cavity (26) formed on an opposite side of the solid electrolyte body (4) from the first cavity (see Fig. 2), and wherein the second cavity (26) extends over the area of the heating surface (28) (see Fig. 2).

Regarding **claim 23**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the second cavity (26) is provided from the outer side of the solid electrolyte body (4) facing away from the external electrode (8), and wherein the second cavity (26) is covered by a second cover (34).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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7. Claims 18-21, and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usami et al. (US 4,875,981) as applied to claim 16 above.

Regarding **claim 18**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the electrodes are exposed to the internal or external measurement gas through a porous ceramic layer (32, 34, and 36).

While reference does not disclose a first cover at the opening of the first cavity, it would have been obvious to one having ordinary skill in the art at the time the invention was made to place the porous ceramic layer (36) to cover the opening as opposed to the outer surfaces of the electrodes, since it has been held that rearranging parts of an invention involves only routine skill in the art while the device having the claimed dimensions would not perform differently than the prior art device, *In re Japikse*, 86 USPQ 70 (CCPA 1950) (see MPEP § 2144.04).

Regarding **claim 19**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the first cover (where the first cover is considered the rearrangement of the porous ceramic layer (36)) is comprised of a gas-permeable, porous material and covers the first cavity (see Fig. 2 and C7/L21-24).

Regarding **claim 20**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein at least one gas passage hole leading to the first cavity is provided (C7/L21-24, although a gas passage

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hole leading to the first cavity is not explicitly disclosed, it is inherent that the porous ceramic layer comprised of a pores for gas to traverse).

Regarding **claim 21**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the at least one gas passage hole is incorporated in one of the solid electrolyte body or in the first cover (see Fig. 2 and C7/L21-24, where the first cover is considered the rearrangement of the porous ceramic layer (36)).

Regarding **claim 26**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein at least one of the first cavity (see Fig. 2) and the second cavity (26) contains a porous ceramic layer (32, 34 and 36).

While reference does not disclose wherein at least one of the first cavity and the second cavity is filled with a highly porous ceramic, it would have been obvious to one having ordinary skill in the art at the time the invention was made to place the porous ceramic layer (32, 34 or 36) used to cover the outer surfaces of the electrodes in a way to fill either the first or second cavity as an alternative way to filter the external gas, since it has been held that rearranging parts of an invention involves only routine skill in the art while the device having the claimed dimensions would not perform differently than the prior art device, *In re Japikse*, 86 USPQ 70 (CCPA 1950) (see MPEP § 2144.04).

Regarding **claim 27**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein braces are positioned in each of the first cavity and the second cavity to brace the first cover (36) and the

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second cover (34) against the bottom of the corresponding first cavity (see Fig. 2) and the second cavity (26) (see Fig. 2, although braces are not explicitly disclosed it is inherent that the first cover (36) and the second cover (34) are held into place).

Regarding **claim 28**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the first cover (36) and the second cover (34) are made of a material (C7/L17-24) having a higher thermal coefficient of expansion than a material of the solid electrolyte body (C6/L48-53, although the cover material having a higher thermal coefficient of expansion than the material of the solid electrolyte body is not disclosed, it is inherent).

Regarding **claim 29**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the sensor element (2) is for a wideband lambda sensor (abstract), and wherein the internal (6) and external (8) electrodes form a pump cell (C6/L3-10), and wherein a reference gas channel (see Fig. 2, where the reference gas channel is the area where the air flows to the reference electrode (14) and a test gas chamber (16) are formed in the solid electrolyte body, and wherein the test gas chamber (16) houses the internal electrode (6) and one of a test electrode (12) or a Nernst electrode opposite from the internal electrode (6), and wherein a reference electrode (14) is situated within the reference gas channel (see Fig. 2).

While reference does not disclose where the test chamber (16) is connected to the first cavity via a diffusion barrier, it would have been obvious to one having ordinary skill in the art at the time the invention was made to place

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the porous ceramic layer (34) between the first cavity (see Fig. 2) and the test chamber (16) as opposed to being placed on the sensing electrodes (12) in the test chamber (16), since it has been held that rearranging parts of an invention involves only routine skill in the art while the device having the claimed dimensions would not perform differently than the prior art device, *In re Japikse*, 86 USPQ 70 (CCPA 1950) (see MPEP § 2144.04).

Regarding **claim 30**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the first (see Fig. 2) and second (26) cavities extend over regions of the internal electrode (6), the external electrode (8), the one of the test electrode (12) or the Nernst electrode, and the reference electrode (14) (see Fig. 2).

8. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usami et al. (US 4,875,981) as applied to claims 1 and 22 above in further view of Allen et al. (US 6,652,987).

Regarding **claim 24**, Usami discloses all the limitations as set forth above and further discloses a sensor element (2) wherein the bottom surface (24) of the second cavity (26) opposite the second cover (34) is provided with a coating having low emissivity (see Fig. 2 and C7/L). Usami, however, does not explicitly disclose the cover having a coating with low emissivity.

Allen discloses a method for forming an article having a protective coating which reduces the radiation heat transport through the ceramic coating (abstract). Furthermore, the coating has at least one reflective metallic layer embedded within (abstract).

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Usami and Allen are combinable because both are concerned with the same field of endeavor, namely heat transportation through a substrate.

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the protective coating with the reflective metallic layer embedded within into the covers of Usami, as taught by Allen, to provide an article capable of reducing radiation heat transfer as well as the radiative contribution to the overall heat transfer through a ceramic coating (C2/L5-11).

Regarding **claim 25**, modified Usami discloses all the limitations as set forth above and Allen further discloses a sensor element (2) wherein the coating is made of one of: a) high-melting noble metals; or b) oxides of high-melting noble metals (C3/L11-20, it is inherent that yttria has a high melting point).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUSAN THAI whose telephone number is (571)270-1487. The examiner can normally be reached on Monday-Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S.T./

/Brian J. Sines/
Supervisory Patent Examiner, Art Unit 1795